Special Session V

Special Session Basic Information:

专栏题目 **Session Title**	中文：Analysis, Assessment, Evolution, and Construction Technology of Urban Power Grid Morphology 英文：大型城市电网形态分析、评估、演进及构建关键技术

专栏介绍和征稿主题
Introduction and topics

中文：随着全球城市化进程加速和能源转型深化，大型城市电网作为现代都市的“能源命脉”，正经历着前所未有的变革。分布式能源高比例渗透、多元负荷复杂互动、数字化技术深度融合，正在重塑城市电网的形态与运行逻辑。在此背景下，如何科学分析电网结构特征，评估其韧性、经济性与可持续性，探索面向碳中和的演进路径，并攻克关键构建技术，已成为学术界与工业界共同关注的战略议题。本专栏旨在搭建高水平交流平台，汇集国内外研究成果，共同推动城市电网形态相关理论与技术创新的前沿探索。

英文：As global urbanization accelerates and the energy transition deepens, large-scale urban power grids—the "energy lifelines" of modern cities—are undergoing unprecedented transformations. The high penetration of distributed energy resources, complex interactions of diverse loads, and deep integration of digital technologies are reshaping the form and operational logic of urban grids. In this context, how to scientifically analyze grid structural characteristics, assess their resilience, economic efficiency, and sustainability, explore evolution pathways toward carbon neutrality, and overcome key construction technologies have become strategic issues of common concern to both academia and industry. This column aims to build a high-level exchange platform, gathering research achievements from around the world to jointly advance cutting-edge exploration in the theory and technological innovation of urban power grids.

Special Session Chair(s):

姓名 **Name**	王颖
称谓 **Prefix**	副教授
部门 **Department**	电气工程学院
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Organizer’s Brief Biography

中文：王颖，博士，北京交通大学电气工程学院副教授，硕士生导师。主要研究方向为韧性电网和电力交通融合。以主要撰写人身份出版《韧性电网》专著 1 部；发表和录用学术论文 60 余篇，论文获评 2022 年中国电机工程学会优秀论文一等奖、2023 年度中国精品科技期刊顶尖学术论文。获批主持国家自然科学基金面上、青年科学基金项目各 1 项、中国博士后基金面上项目 1 项，以骨干成员身份参与国家重点研发计划等项目 20 余 项；获授权发明专利 20 余项，软著 3 项；获国网总部科技进步二等奖、国网上海市电力公司科技进步一等奖。入选北京交通大学青年托举人才计划。现担任 IEEE PES 中国会员委员会秘书长、IEEE PES 电网韧性(弹性)分委会秘书长，获评 IEEE PCCC Outstanding Volunteer Award 和 IEEE PES 卫星技术委员会杰出女性科学家奖等。

英文：Ying Wang, Ph.D., is an Associate Professor at the School of Electrical Engineering, Beijing Jiaotong University. Her main research interests focus on resilient power grids and the integration of power and transportation systems.

As a primary author, she has published one monograph titled "Resilient Power Grids." She has published over 60 academic papers, with her work receiving the First Prize of Outstanding Paper Award from the Chinese Society for Electrical Engineering in 2022 and being recognized as a Frontrunner 5000 Top Articles in Outstanding S&T Journals of China in 2023. She has led more than ten research projects, including one General Program and one Youth Science Fund project of the National Natural Science Foundation of China, and one General Project of the China Postdoctoral Science Foundation. Additionally, she has participated as a key member in over 20 projects, including the National Key R&D Program of China. She holds more than 20 authorized invention patents and three software copyrights. Her contributions have been honored with the Second Prize for Scientific and Technological Progress from the State Grid Headquarters and the First Prize for Scientific and Technological Progress from the State Grid Shanghai Municipal Electric Power Company.

She currently serves as the Secretary-General of the IEEE PES Chapters Council Members (PCCC) Committee and the Secretary-General of the IEEE PES Power Grid Resilience Subcommittee. She has been awarded the IEEE PCCC Outstanding Volunteer Award and IEEE PES China Satellite Technical Committee Outstanding Female Scientist Award.

	姓名 **Name**	宫一玉
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	城市/地区 **City/Region**	北京

Organizer’s Brief Biography

中文：宫一玉， 1987 年出生，中共党员，硕士研究生学历，毕业于浙江大学电气工程学院电力系统及其自动化专业，高级工程师职称。

任职北京电力经济技术研究院配网规划研究中心主任，长期深耕电网规划领域，主导多项省公司级，省部级重点项目，包括《首都数智化坚强电网建设方案研究》《全国电网发展格局研究(华北区域)》等。牵头完成《北京市"十五五"配电网规划》等 18 项关键规划，构建"1+7+11"规划研究体系，为区域电网的安全稳定运行与绿色低碳转型提供了重要技术支撑。

科研成果方面，累计获得省部级，省公司级奖项 20 余项。其中，《北京电网中长期调峰能力规划》荣获 2022 年度电力行业优秀工程咨询成果三等奖，《基于可控负荷特性的大型受端城市电网负荷优化及调控策略》荣获 2022 年度电力建设科学技术进步奖三等奖，《北京电网燃气电厂热电解耦可行性及新能源消纳分析》获评国网北京市电力公司科技进步三等奖。此外，拥有《需求侧负荷控制方法》等 3 项发明专利，并参与编制《配电网后评价技术规范》《10 千伏及以下配电网设施配置技术规范》等 5 项行业及企业标准，发表《城市电网柔性负荷灵活互动策略研究与应用》等 2 篇专题技术著作，相关成果已广泛应用于电网规划实践，发挥了重要实用价值。

英文：Yiyu Gong, born in 1987, is a member of the Communist Party of China. She holds a Master’s degree, having graduated from the College of Electrical Engineering at Zhejiang University with a specialization in Power System and Its Automation. She is also a senior engineer.

Currently serving as the Director of the Distribution Network Planning Research Center at the Beijing Electric Power Economic and Technology Research Institute, she has long been dedicated to the field of power grid planning. She has led multiple provincial and ministerial-level key projects, including Research on the Construction Plan for a Digitalized and Resilient Power Grid in the Capital and Research on the National Power Grid Development Framework (North China Region). She spearheaded the completion of 18 critical planning projects, such as the *Beijing "15th Five-Year" Distribution Network Plan*, and established a "1+7+11" planning research system, providing essential technical support for the secure, stable operation and green, low-carbon transformation of regional power grids.

In terms of scientific research achievements, she has received over 20 provincial and ministerial-level awards. Notably, Medium- and Long-Term Peak Shaving Capacity Planning for the Beijing Power Grid won the third prize for Outstanding Engineering Consulting Achievements in the Power Industry in 2022. Load Optimization and Regulation

Strategies for Large Receiving-End Urban Power Grids Based on Controllable Load Characteristics was awarded the third prize for Scientific and Technological Progress in Power Construction in 2022. Feasibility Analysis of Heat-Power Decoupling and Renewable Energy Integration for Gas Power Plants in the Beijing Power Grid received the third prize for Scientific and Technological Progress from State Grid Beijing Electric Power Company. Additionally, she holds three invention patents, including Demand-Side Load Control Method, and participated in drafting five industry and corporate standards, such as Technical Specifications for Post-Evaluation of Distribution Networks and Technical Specifications for the Configuration of 10 kV and Below Distribution Network Facilities. She has also published two specialized technical works, including Research and Application of Flexible Load Interaction Strategies for Urban Power Grids. These achievements have been widely applied in power grid planning practices, demonstrating significant practical value.

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Organizer’s Brief Biography

中文：刘方蓝，汉族，1980 年 6 月出生，硕士研究生，高级工程师，北京市电力公司一级专家，中国电力规划设计协会供配电设计专家，持有注册电气工程师（发输变）、注册咨询师（投资）、注册监理工程师执业资格。

自 2006 年重庆大学电力系统专业硕士研究生毕业后，一直从事电网规划设计工作 20 年，参与了北京电网“十二五”至“十五五”四个五年规划，完成了《北京公司“十五五”配电网规划》等系列规划及研究报告 50 余项。主要研究方向为新型配电网优化规划方法研究、配电网承载力与灵活性提升技术研究等，完成《北京城市副中心配电网差异化规划典型接线研究》、《面向复合灾害的新型城市配电系统多要素协同优化与灵活组态运行技术研究》等科技项目及课题研究 20 余项。

英文：Fanglan Liu, Han ethnicity, born in June 1980, holds a master's degree and is a senior engineer. She is a first-level expert at the Beijing Electric Power Company, a power supply and distribution design expert at the China Electric Power Planning and Design Association, and holds professional qualifications as a Registered Electrical Engineer (generation, transmission, and transformation), Registered Consultant (investment), and Registered Supervision Engineer.

Since graduating with a master's degree in power system engineering from Chongqing University in 2006, she has been engaged in power grid planning and design for 20 years. She has participated in four five-year plans for the Beijing power grid, spanning from the 12th Five-Year Plan to the 15th Five-Year Plan, and completed over 50 planning and research reports, including the "15th Five-Year Distribution Network Plan of Beijing Company." Her main research focuses on optimization planning methods for new distribution networks and technologies for improving the capacity and flexibility of distribution networks. She has completed more than 20 scientific research projects and studies, such as "Research on Differentiated Planning and Typical Connection Methods for the Distribution Network in the Beijing Sub-Center" and "Research on Multi-Factor Collaborative Optimization and Flexible Configuration Operation Technologies for New Urban Distribution Systems Facing Composite Disasters."